

DPF Newsletter - August 2000

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DPF 2000 took place August 9-12, 2000 at Ohio State University (Columbus, Ohio). Further information is at <http://www.dpf2000.org/>. The 2001 APS meeting will be April 28 - May 1 in Washington, D.C. Our next divisional meeting will be in May, 2002 at College of William and Mary in Virginia.

The DPF newsletter is published roughly three times a year. Contributions are welcome. Send them to the Editor.

Editor :

Catherine Newman-Holmes (DPF Secretary-Treasurer),

DPF Election

It is time once again for a DPF election. This year we will elect a Vice-Chair, a Secretary- Treasurer and two regular members of the Executive Committee. The Vice-Chair will enter our four-person Chair line (see below) and become Chair in 2003. The Secretary-Treasurer will serve a three-year term. The two Executive Committee members will join four Executive Committee members remaining on the committee. The current members of the DPF Executive Committee and the final years of their terms are

Chair: Eugene Beier (2000).

Chair-Elect: Chris Quigg (2000).

Vice-Chair: Stanley Wojcicki (2000).

Past Chair: Howard Gordon (2000).

Secretary-Treasurer: Catherine Newman-Holmes (2000).

Division Councillor: Sally Dawson (2003), Peter Meyer (2004).

Executive Committee Members: Vernon Barger (2001), Bill Carithers (2002), Janet Conrad (2002), Glennys Farrar (2001), Nicholas Hadley (2000), Donna Naples (2000).

The nominees for Vice-Chair are Jon Bagger (Johns Hopkins University) and Mel Shochet (University of Chicago). Nick Hadley (University of Maryland) and John Jaros (SLAC) are the candidates for Secretary-Treasurer. The nominees for regular members of the Executive Committee are Marty Breidenbach (SLAC), Young-Kee Kim (University of California, Berkeley), Fred Olness (Southern Methodist University) and Harry Weerts (Michigan State University). Statements from the candidates appear at <http://www.aps.org/units/dpf/candidates.html>. We will once again have an e-mail election. DPF members with valid e-mail addresses on file with APS will receive ballots by e-mail. Other DPF members will receive paper ballots. Candidate statements will be mailed with the paper ballots.

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Snowmass 2001: A Summer Study on the Future of Particle Physics

(Contributed by Chris Quigg, DPF Chair-Elect)

The Division of Particles and Fields and the Division of Physics of Beams are organizing a summer study on the future of particle physics as a community event, to be held in Snowmass, Colorado from June 30 to July 21, 2001. Ron Davidson <rdavidson@pppl.gov> (DPB) and Chris Quigg <quigg@fnal.gov> (DPF) are leading the organization. Every particle physicist is welcome, and we will encourage extensive international participation.

We conceive of the DPF/DPB summer study as a very inclusive gathering, devoted to the field of particle physics broadly understood. We seek to stimulate mixing among theorists, accelerator physicists, and experimenters, and to promote engagement among different communities of interest. We count on young physicists to help invent our future. The Snowmass Association has offered subsidized housing for up to fifty students, to encourage participation by our youngest colleagues.

Snowmass 2001 will be devoted to particle physics as a whole, including experiments at the highest energies and experiments of exceptional sensitivity and those that explore very high scales through virtual effects. We will consider investigations that use accelerator beams and those that rely on natural sources, and draw on theory that develops hand-in-hand with experiment as well as visionary ideas that haven't yet engaged experiment directly. We will consider new accelerators to address a broad range of scientific opportunities, and we will look at the interplay between particle physics and technology, as well as the interaction between particle physics and related fields.

In addition to an ambitious set of scientific goals, we intend to mount a vigorous and diverse program of outreach and education, to reach the population of Aspen, Snowmass, and surrounding communities, and to display to all of us the many approaches to outreach that our colleagues have put into practice. We also plan to educate ourselves through a small number of "teach-ins" on topics we need, as a community, to understand better, for example, how you can contribute to accelerator R&D.

We welcome your ideas for working groups, teach-in topics, and outreach activities. We look forward to Snowmass 2001 as an opportunity for our community to articulate its scientific aspirations and to begin to map a path to the future. We hope to see you there!

DPF Congressional Reception

(Contributed by Howard Gordon, BNL, DPF Past-Chair)

The annual Congressional Reception was held on May 16, 2000 sponsored by DPF, DNP and DPB. Prof. Bunny Clark was the Chair and aided by Howard Gordon. This year the site was the Foyer of the Rayburn Office Building, which was an excellent location - larger than previous years. We made an attempt to assign physicists to directly meet with Members of Congress and their staffs on that day. We focused on 63 Members of the key subcommittees relevant to the DOE and NSF authorization and appropriation process. About 80 physicists from the three Divisions registered for the Reception. On the morning of May 16, Michael Lubell (APS) held a briefing at the APS office. A key chart from the AAAS was given showing the rise by a factor of three in government funding of the life sciences in the last 30 years while physical sciences have had flat funding. Many important people are calling for investing in a more "balanced portfolio". Also information was given about the bill to double the government spending for research.

Visits to the offices of the Members took place during the day. Many physicists reported interesting discussions. At the reception several Members came and Representatives Vernon Ehlers and Rush Holt delivered short speeches. Many Congressional staff came as well as members of the Executive Branch: OMB, OSTP, DOE and NSF. The real benefit of the Reception is to foster an environment where all the people can talk together without the formality of making appointments.

We asked participants to evaluate the reception. Those that did write something all agreed that the concept is of value but must be followed up with specific letters. In directly interacting with Members and their staffs, we can bring enthusiasm for our science and hear things from their perspective as well.

It takes a lot of organization to hold this event so it is important that planning begin early for next year's reception.

QuarkNet: A long-range effort in Particle Physics Education and Outreach

(Contributed by Tom Jordan(Fermilab), Tom Loughran (Trinity School, South Bend, IN), and Randy Ruchti (Notre Dame))

High school physics teacher Rick Dower spent Summer 2000 teaching particle physics to fifteen other teachers in suburban Boston as a lead teacher for the Boston University/Northeastern University QuarkNet center. Dower is in his second year as a lead teacher with the center. In 1999, his first year in the program, he worked with BU physicist Ulrich Heintz in an eight-week summer research program examining prototype silicon detectors for the Dzero Upgrade Silicon Micro-strip Tracker. Now he, with the help of Heintz and other BU/NEU physicists, is sharing his new-found knowledge and experience in particle physics research with other high school teachers in the Boston area.

Similar activities are taking place at 11 other centers around the United States this summer.

Dower and Heintz are members of QuarkNet, a national program that partners high school physics teachers with physicist mentors working on hadron collider physics experiments at the Fermilab Tevatron and the CERN LHC. The goal of QuarkNet is to establish, in five years time, centers at 60 research institutions in the US actively involved in CDF, Dzero, ATLAS and CMS experiments. Twelve new centers are added to the program each year, and BU/NEU is among the first group of twelve. At the centers, high school teachers are engaged as active participants in particle physics research with physicists.

A QuarkNet center is developed over a period of three years. In year one, two lead teachers are paired with two physicists from a region for eight weeks of work that is coupled to the mentor physicists' research. At the outset, the lead teachers attend a one-week orientation workshop at Fermilab where they are introduced to particle physics, particle physicists and life at a particle physics laboratory. The workshop includes a combination of invited lectures, tours of laboratory experiments and facilities, inquiry-based activities involving experimental and Monte Carlo data, and social interaction. At the conclusion of the workshop, the teachers are immersed in research projects directed by their mentors, just as graduate students and technical staff would be. They learn through hands-on experience and are active participants in research teams.

In year two, the lead teachers and mentors invite up to ten additional teachers from their local area to a three-week workshop at their Center. These "associate" teachers learn about particle physics and the experimental program at the center via lectures, tours, inquiry activities, and experimental research. In these workshops, the teachers develop materials for classroom transfer - adapting ideas and examples from particle physics to classroom practice such as exercises in momentum and energy conservation based on top quark decays and studies of particle lifetimes based on charm particle decays and muon decays. This gives a direct connection of their QuarkNet experience to student activities in their classrooms.

In year three, a one-week workshop is hosted locally at the center for all teachers to review effectiveness of classroom transfer and to update everyone on the latest research activities in particle physics. An important aspect of QuarkNet is to make certain that datasets from the hadron collider experiments are posted on the Web so that teachers and high school students have "real time" access to the excitement of experimental research at the energy frontier. It is important to note that students of high-school age now will be graduate students when LHC experiments are taking first data! It is hoped that some of the students reached through QuarkNet will be engaged by the excitement of the field and be contributors to the next generation of particle physics machines and detectors.

Keith Baker (Hampton University), Marge Bardeen(FNAL), Michael Barnett (LBNL), and Randy Ruchti (Notre Dame) serve as the principal investigators of QuarkNet. They oversee the work of four staff members: Kenneth Cecire (HU), Andria Erzberger

(LBNL), Thomas Jordan (FNAL) and Patrick Mooney (UND) who work closely with the teachers and physicists throughout a center's participation in the program. By 2005, QuarkNet is expected to involve nationwide 720 teachers through research and workshops and up to 100,000 high school students through classroom transfer, Web-based activities and laboratory experiences.

Currently active QuarkNet centers include: Boston University and Northeastern University; Brookhaven National Laboratory; University of California at Irvine; University of California at Riverside; University of California at Santa Cruz; University of Chicago; Columbia University; Fermilab; University of Florida; Florida State University; Hampton University; University of Illinois at Chicago; Indiana University; University of Iowa and Iowa State University; Michigan State University; State University of New York at Albany; State University of New York at Stony Brook; University of Notre Dame; University of Oklahoma and Langston University; University of Pennsylvania; University of Rochester; Southern Methodist University; University of Texas at Arlington; and University of Washington.

For further information about QuarkNet and/or to apply to the program, contact the Website at <http://quarknet.fnal.gov>.

NEW NRC STUDY: FROM QUARKS TO THE COSMOS

(Contributed by Michael Turner, University of Chicago)

The NRC has begun a two-year study entitled From Quarks to the Cosmos. It will focus on science at the intersection of astronomy and physics. The first phase, which is scheduled for completion by November 2000, will focus on key science questions and opportunities for breakthroughs. The second phase will set priorities for implementation and recommend mechanisms for coordination and cooperation between the NSF, NASA, and DOE. This study will complement other recent NRC science assessments (e.g., Decadal Astronomy Survey; Nuclear, Gravitational, and Elementary Particle Physics Reports).

During the second phase, which begins in January 2001, there will be a series of open meetings for community input. There are tentative plans to have such sessions at the January 2001 Meeting of the AAAS in San Diego, the April 2001 Meeting of the APS in Washington, DC and the Snowmass Workshop in July 2001.

The website for the NRC Committee on the Physics of Universe is <http://nationalacademies.org/bpa/projects/cpu>. E-mail input can be sent to q2c@nas.edu.

Committee Members

Michael Turner - Chair (Chicago), Roger Blandford (Caltech), Sandra Faber (Santa Cruz), Thomas Gaisser (Bartol), Fiona Harrison (Caltech), John Huchra (Harvard), Helen Quinn (SLAC), R.G.H. Robertson (U Wash), Bernard Sadoulet (Berkeley), Frank Sciulli, (Columbia), David N. Spergel (Princeton), J. Anthony Tyson (Lucent), Frank Wilczek

(MIT), Clifford Will (Wash U), Bruce Winstein (Chicago)

Summary of the Charge to the Committee

The Committee on Physics of the Universe will carry out an assessment of an area of science at the intersection of physics and astronomy. The study will provide a broad vision that goes beyond traditional categories of space missions, laboratory studies, telescope observations, and accelerator experiments. It will focus on opportunities for breakthroughs in understanding the birth, evolution and destiny of the Universe, the laws that govern it, and even the nature of space and time. The assessment will encompass astrophysical and cosmological phenomena that give insight into fundamental physics and fundamental physics that is relevant to understanding the universe and the diversity objects within it. It will address opportunities to explore new science through (1) new techniques for observing phenomena in extreme environments and new regimes, (2) new applications of fundamental physics to modeling and simulating the origin, evolution, and fate of the universe, and (3) understanding fundamental physics by using space and the cosmos as a laboratory full of experiments that could never be implemented on the Earth.

News from DOE and HEPAP

(Contributed by John Metzler, Executive Secretary HEPAP, Office of Science, U.S. Department of Energy)

Peter Rosen, DOE's Associate Director for High Energy and Nuclear Physics in the Office of Science, noted at the March 2000 meeting of HEPAP that the upcoming elections would usher in a new Administration, and that the Office of Science would need to apprise them of the state of the field of High Energy Physics. Recent developments, such as the operation of the Main Injector and the B-Factory, the experimental evidence of a neutrino mass, and recent HEP budgets that were below constant-level-of effort levels, have overtaken the Gilman report. Dr. Rosen suggested to HEPAP a White Paper as a way to arrive at a coherent vision of the field of high energy physics. Also at HEPAP, the new SLAC and Fermilab Directors, Jonathan Dorfman and Mike Witherell respectively, reported on their "\$50 million" problem with the FY 01 budget, a consequence of the persistent decline in funding for operations and equipment in the DOE HEP budget in relation to the total DOE HEP budget over the past ten years.

On June 13, 2000, the Acting Director of DOE's Office of Science, James Decker, sent to the Chairman of HEPAP a letter requesting a White Paper that updates the 1998 Subpanel Report, and that would provide input into a formal HEPAP Subpanel, the charge for which would come in late 2000. The letter also notes that NSF and DOE are discussing seriously joint agency sponsorship of HEPAP.

The DOE-NSF Joint Oversight Group met in June. The US LHC program has begun to plan ahead for the research phase of the LHC program, and is addressing the requirements for software development and computing, resources needed to maintain and operate equipment, and the phasing of US efforts with CERN's plans.

The Global Science Forum (GSF) sponsored a workshop in London on April 3-15, 2000, which resulted in a recommendation for a High Energy Physics Consultation Group. The GSF meets at the end of June to take up this recommendation. The GSF is designed to bring government officials with responsibilities for science policy and budget formulations together to find ways to run their programs more efficiently and effectively through common understanding and international cooperation.

News from NSF

(Contributed by Marvin Goldberg, Elementary Particle Physics, National Science Foundation)

The National Science Foundation has a program called PHYSICS FRONTIERS CENTERS (PFCs). Here is a synopsis of the program:

The Physics Frontiers Centers (PFCs) program supports university-based centers and large groups in cases where this mode of research is required to make transformational advances in the most promising research areas. Proposals will be considered in areas within the purview of the Division of Physics, broadly interpreted, e.g., atomic, molecular, optical, plasma, elementary particle, nuclear, astro-, gravitational, interdisciplinary, and emerging areas of physics. Interdisciplinary physics is taken here to mean research at the interface between physics and other disciplines, e.g., biophysics, quantum information science, mathematical physics. The purpose of the PFC program is to enable major advances at the intellectual frontiers of physics by providing needed resources not usually available to individual investigators or small groups. PFCs make it possible to address major challenges that require, e.g., combinations of talents, skills, and/or disciplines; specialized infrastructure; large collaborations; and centers/institutes that catalyze rapid advances on the most promising research topics. The successful PFC will demonstrate: (1) the potential for a profound advance in physics, broadly defined; a major impact on another field; or benefit to society; (2) a synergy or value-added rationale that justifies a center-like approach; and (3) creative, substantive activities aimed at enhancing education, diversity, and public outreach.

PREPROPOSAL DEADLINE: September 18, 2000

FULL PROPOSAL DEADLINE: January 26, 2001

ELIGIBILITY INFORMATION

Organization Limit: Proposals may be submitted by universities and colleges in the United States. In cases involving multi-institutional consortia, a single entity must accept overall management responsibility.

PI Eligibility Limit: None

Limit on Number of Proposals: No more than two pre-proposals may be submitted by any one institution. Any one individual may be the Principal Investigator (PI) for only one pre-proposal. The same limitations apply to full proposals.

AWARD INFORMATION

Anticipated Type of Award: Grant

Estimated Number of Awards: 3-5

Anticipated Funding Amount: Up to \$10M will be available for new PFC grants in FY 2001

Anticipated date of award: On or about August 1, 2001

Further information is available at <http://www.nsf.gov/cgi-bin/getpub?nsf00108>.